

Alternative Scenario

- Release MD & Heavy Duty Engines 0.5 gr NOx in 2004
- Wait a Year
- Then pursue 0.2 gr NOx as a follow-on to 0.5 gr NOx
- Incremental approach

Questions & Comments

■ Question

- Is there an incentive to pursue alternative technologies to achieve 0.2 gr NOx using this approach?
- Can the diesels achieve 0.2 gr by 2007?
- Will there be an economic case for NG in 2007?
- Are we straying from the plan we began with by delaying?
We need product as soon as we can obtain it.

■ Comments

- Millions will be necessary to get to 0.2 gr NOx on NG
- Near-term money will be spent on diesels, NG will be investigated later
- We should pursue the original goal to deliver vehicles by 2004, then revisit emissions and work to reduce from there.
- We'll know better in 2004 whether we can tweak the technology and the vehicle to achieve 0.2 gr NOx.
- Benefit of this program is to get technologies that are in progress into vehicles and into the marketplace.
- Working Group should rely on judgment of NREL and DOE to finesse the details. Achieving 0.5 gr by 2004 would be a significant accomplishment.

■ Comments

- Low NOx project is working on 0.5 gr heavy-duty engine
- DOE must support EPA's 0.2 gr limit in 2007
- OHVT must take a longer term view
- We need to sell more, cleaner vehicles
- Task B provides an element for manufacturers to do market research to determine what engines and vehicles are needed
- Only in the environmental world do you feel you have to apologize for 0.5 gr NOx. Our ultimate goal should be well below diesel, perhaps 0.05 gr.

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- Chassis today will accept NG engines
 - Chassis and cab modification requires 2 years and \$50 million
 - Chassis manufacturers will not want to refresh a trash truck design for a market of 2000 trucks.
 - We need to find some way to meet current needs and achieve long-term goals.
 - There are two issues – 1) emissions and 2) competitiveness of NG vehicles
 - If we focus all the funding on engines there won't be anything left for the vehicles and competitiveness of the vehicle
 - The more you focus on one market segment, the greater likelihood of success

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- Guaranteed sales to the Federal government could better justify the investment in development
 - There aren't any 0.5 gr NOx medium-duty engine projects in progress
 - The market today is heavy-duty on trash trucks and transit buses. Medium-duty engines are used in shuttle vehicles
 - It may be easier to develop a 0.5 gr engine for medium-duty based on spark ignited block.
 - There are medium-duty engines in progress that are certified to 1.5 gr and are thinking about 0.5 gr med-duty
 - Concerning the second option, you may need a bit longer to develop/enhance the LNG fuel system

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- Can we have a phased program that delivers 0.5 in the near term and 0.2 in the long-term?
 - Kick off some longer-term work on 0.2 at the same time that we start the 0.5 work
 - You need to have a long-term perspective. Whatever final plan you adopt, you need to meet the diesel requirements or you give the market an excuse not to buy NG
 - You must have specific goals in order to gain the interest and commitment of manufacturers to invest millions of dollars.
 - Some of the technology we will need to achieve 0.2 must flow out of the diesel engine technology. That work hasn't started in earnest and we can't leverage it yet.

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- We could try to get ahead or we can use the results of the diesel work. It may not be the best use of our funds to try to get ahead of diesel.
 - We can actively pursue 0.5, we have projects in progress and we believe we can be successful
 - If we focus too much on the 0.2, we could dilute the effort and fail to accomplish anything effectively
 - Agreement, but government agencies need to be working on 0.2 at the same time that we pursue near-term goals.
 - We like the RFP that defines 0.5 as the primary goal and 0.2 as the stretch goal.

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- We need to have commercially viable products that meet our energy efficiency goals as well as meeting emissions goals.
 - DOE is not in the business of championing EPA goals, but will not counter their goals.
 - Greatest recent environmental achievement is 3-way catalyst, millions were spent to achieve this accomplishment. Similar investment will be needed to achieve diesel emission targets. We don't have the budget to lead this effort. We will follow and we will optimize the technology for NG and will use it to achieve an emissions reduction of 2 to 4 times over diesel.